

Claims

1. A method of forming a wound dressing, which method comprises forming a protein polymer by reacting a protein with a polyfunctional spacer, or an activated derivative thereof.
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2. A method as claimed in Claim 1, wherein the protein polymer is formed *in situ*.
- 10 3. A method as claimed in Claim 1, wherein the protein polymer is formed prior to application.
4. A method as claimed in Claim 3, wherein a supporting substrate is incorporated into the dressing.
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5. A method as claimed in Claim 3 or 4, wherein the dressing is in the form of a bandage or gel sheet.
6. A method as claimed in any preceding claim, further comprising the application to the wound dressing of a vapour-permeable membrane.
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7. A method as claimed in any preceding claim, wherein the protein is a globular protein.
- 25 8. A method as claimed in any one of Claims 1 to 6, wherein the protein is a fibrous protein.
9. A method as claimed in Claim 7, wherein the globular protein is a serum protein.
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10. A method as claimed in Claim 9, wherein the protein is albumin.

11. A method as claimed in Claim 10, wherein the albumin is human serum albumin.
12. A method as claimed in Claim 1, wherein the protein is blood-derived.
- 5 13. A method as claimed in Claim 1, wherein the protein is a recombinant product.
- 10 14. A method as claimed in any preceding claim, wherein the spacer is selected from the group consisting of polycarboxylic acids, polyamines, poly(carboxy/amino) compounds, polyalcohols, polyketones, polyaldehydes and polyesters.
- 15 15. A method or wound dressing as claimed in Claim 14, wherein the spacer is a polycarboxylic acid.
16. A method as claimed in Claim 15, wherein the polycarboxylic acid is a dicarboxylic acid.
- 20 17. A method as claimed in Claim 16, wherein the dicarboxylic acid is an alkylene dicarboxylic acid.
18. A method as claimed in any preceding claim, wherein the spacer is activated to facilitate reaction with the protein molecules.
- 25 19. A method as claimed in Claim 18, wherein the activating agent is a carbodiimide compound.
20. A method as claimed in Claim 19, wherein the carbodiimide compound is ethyl[dimethyleminopropyl]-carbodiimide.
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21. A wound dressing prepared by the method of any preceding claim.
22. A wound dressing comprising a protein polymer formed by reacting a protein with a polyfunctional spacer, or an activated derivative thereof.
- 5 23. A wound dressing as claimed in Claim 22, which is formed *in situ*, by reaction of the protein and polyfunctional spacer, or activated derivative thereof, at the wound site.
- 10 24. A wound dressing as claimed in Claim 22, which is preformed, prior to application of the dressing to the wound site.
25. A wound dressing as claimed in Claim 24, which comprises a bandage impregnated with the protein polymer.
- 15 26. A wound dressing as claimed in Claim 24, which is in the form of a gel sheet.
27. A wound dressing as claimed in Claim 25, in which the gel sheet has a supporting substrate.
- 20 28. A wound dressing as claimed in any one of Claims 21 to 27, which further comprises one or more therapeutically active agents.
- 25 29. A wound dressing as claimed in Claim 28, wherein the therapeutically active agents are selected from the group consisting of antibiotics, antivirals, anti-inflammatory agents, pain killers, haemostatic agents, phages, growth factors, anti-scarring agents, odour-absorbing agents, and agents that promote angiogenesis.

30. A method of forming a protein polymer, which method comprises reacting a protein with a dicarboxylic acid or an activated derivative thereof, provided that the protein is not bovine serum albumin.

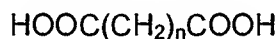
5 31. A method of forming a protein polymer, which method comprises reacting a protein with an alkylene dicarboxylic acid or an activated derivative thereof.

32. A method as claimed in Claim 30 or Claim 31, wherein the protein is an albumin.

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33. A method as claimed in Claim 32, wherein the protein is human serum albumin.

15 34. A method as claimed in any one of Claims 30 to 33, wherein the dicarboxylic acid has the formula



in which n is from 1 to 20, preferably from 2 to 12, and more preferably from 3 to 8.

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35. A method as claimed in any one of Claims 30 to 34, wherein the dicarboxylic acid is activated with a carbodiimide activating agent.

25 36. A method as claimed in Claim 35, wherein the activating agent is ethyl[dimethyleminopropyl]-carbodiimide.

37. A protein polymer formed by reacting a protein with a dicarboxylic acid or an activated derivative thereof, provided that the protein is not bovine serum albumin.

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38. A protein polymer formed by reacting a protein with an alkylene dicarboxylic acid or an activated derivative thereof.

39. A protein polymer as claimed in Claim 37 or Claim 38, which is in the form of a solution.
- 5 40. A protein polymer as claimed in Claim 37 or Claim 38, which is in the form of insoluble particles.
41. A protein polymer as claimed in Claim 37 or Claim 38, which is in the form of a gel.
- 10 42. A use of a protein polymer as claimed in any one of Claims 37 to 41 in the delivery of one or more therapeutically active components to the body.
43. A use of a protein polymer as claimed in Claim 41 in the topical treatment of a wound, burn or ulcer.
- 15 44. A use as claimed in Claim 43, wherein the protein polymer is applied to the wound, burn or ulcer as a preformed gel.
- 20 45. The use as claimed in Claim 43, wherein a protein and a dicarboxylic acid spacer are applied in solution to the wound, burn or ulcer, and the protein polymer is formed *in situ*.
46. The use of a protein polymer as claimed in Claim 37 or Claim 38 as a coating for a device to be implanted in the body.
- 25 47. The use of a protein polymer as claimed in Claim 39 as a platelet substitute or platelet enhancer.
48. A protein polymer as claimed in Claim 39, wherein the protein polymer is conjugated with one or more clotting agents or active peptide derivatives.
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49. A protein polymer as claimed in Claim 48, wherein the protein polymer is conjugated with fibrinogen.

50. A protein polymer as claimed in Claim 39, which polymer is conjugated to a
5 therapeutically active agent, or a precursor thereof, and to a targeting moiety having an affinity with a specific locus within the body.

51. The use of a conjugate as claimed in Claim 50 in targeted anti-cancer therapies.

10 52. A protein polymer as claimed in Claim 39, which polymer is conjugated to a contrast agent and to a targeting moiety having an affinity with a specific locus within the body.

15 53. The use of a conjugate as claimed in Claim 39 in medical imaging applications.

54. A kit for the preparation of a wound dressing according to Claim 21 or Claim 22, which kit comprises a first composition and a second composition, the first composition and the second composition being held in separate containers such
20 that reaction between the first composition and the second composition is prevented.

55. A kit as claimed in Claim 54, wherein the first composition comprises the protein and the polyfunctional spacer, and the second composition comprises an
25 activator for the polyfunctional spacer.

56. A kit as claimed in Claim 55, wherein the first composition is a solution and the second composition is a powder.

57. A method of treatment of the human or animal body, which method
30 comprises the administration to the body of a protein polymer as claimed in any one of Claims 37 to 41.

58. A method as claimed in Claim 57, wherein the protein polymer is administered intravenously.
59. A method as claimed in Claim 57, wherein the protein polymer is
5 administered topically.
60. A method as claimed in any one of Claims 57 to 59, wherein the protein polymer is administered in the form of a solution.
- 10 61. A method as claimed in Claim 59, wherein the protein polymer is administered in the form of a powder.
62. A method as claimed in Claim 59, wherein the protein polymer is administered in the form of a gel.
- 15 63. A method as claimed in Claim 59, wherein the protein and the dicarboxylic acid cross-linking agent are administered to the body, such that the protein polymer is formed *in situ*.